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EDITORIAL

Uniform Cost Accounting by Industries

While the subject of uniform cost accounting is by no means a new one (it has been under discussion almost since cost accounting was introduced to industry), it does seem rather an opportune time to revive it. Many accountants are giving serious thought to plans for improvements in their systems and methods for more efficient operation. It would be well to think of these improvements in co-operation with other units in the industry with a view to uniformity in costing and accounting.

A number of industries, through the efforts of their trade association, have evolved a uniform method of costing which has proved quite successful both to the individual companies and the industry as a whole. In every case the results have more than justified the effort, expense and inconvenience relative to the installation. In the light of such experience one might well ask why such a plan is not adopted in all industries.

It is true there are many problems which render very difficult the formation of a uniform method of costing within any given industry. The manufacturing units are diverse in the extent of their operations, each with its own peculiarities. The systems and methods followed in each unit are quite varied in their degrees of efficiency and complexity. It must also be recognized that it is quite impossible to devise a complete system of cost accounting, which can be applied to all companies in the industry. It is a problem of establishing a method of cost finding which will embrace the broad general principles and yet be applicable to the needs of the individual companies.

Great as these problems may appear to be, yet they can be surmounted and must be considered subordinate to the even greater difficulty of overcoming the objections of accounting executives and managements in making the necessary changes and giving out what is considered to be confidential information. Many attempts to introduce uniform costing have failed because of the unwillingness to make the necessary change to conform to the uniform plan. A company which has a satisfactory system in operation may object to making a radical change while on the other hand a company with a very poor system may not wish to incur the necessary expense in giving effect to the required improvements.

If the plan is going to be successful, it is essential that information must be pooled. Some companies become apprehensive lest confidential information be made known to their competitors and thus discourage their accountants from participation in discussions. It, therefore, becomes a matter of convincing or educating managements in the benefits which will accrue to each individual company and to the industry as a whole by instituting uniform costing.

These advantages are fairly well recognized. All units in an industry must compete on a basis of quality, service and price. The first two bases

are easily discernible and can be analyzed. The latter which is the interpretation of cost cannot be analyzed unless the formation of the elements are known. Products may in ignorance be priced too low by one unit forcing a low price on the whole industry. It naturally follows that in order to compete intelligently as to price, there must be a uniformity in cost structure.

All companies concerned in the formation of the uniform costing plan would receive the benefit of a costing system which would comprise the best features introduced by the individual members. There would be a common basis for making comparison between the individual units and the industry as a whole. Each unit could thereby improve its operating efficiency. Individual lines of product on which a loss had been sustained unknowingly would be revealed, and by eliminating those losses a healthier industry would result. This is particularly true in composite industries where it is essential that a complete line be made available to the consumer. In many instances, one company has introduced a low price based on incorrect costs, thereby affecting the price pattern for the industry.

Uniform costing is not suggested for purposes of price fixing but rather that the individual companies within the industry might compete as to price intelligently on a common basis. No one wishes to revert to those conditions which made it necessary to sell below cost to get business simply because one company computed its cost on a different basis from that used by other companies in the industry.

What is necessary to bring about this desirable feature? It requires the initiative of one or more individuals to bring together the member companies of the industry usually through the medium of trade or accounting associations. It is a natural phase of industrial development and it would be well to consider this important step in any post war plans.

The Society of Industrial Accountants of British Columbia

On Monday, March 26th, the Private Bill to incorporate the Society of Industrial Accountants of British Columbia passed the third reading and received Royal Assent on March 28th. The petitioners of the bill were the following:—

Norman Terry	Jacob A. H. Irving
Murray Gilmour	Charles F. Bailey
Richard C. Lucas	Victor E. Feimann
Peter Russell	Frederick A. Coburn
Robert A. McIntyre	Alfred W. Ingall
Nicholas Abramsen	Clifton H. Davis.

The passing of this Bill represents the culmination of many months of persistent effort on the part of the officers of the Vancouver Chapter. These men may well look upon their achievement with a great deal of pride. Not only does it mean a great step forward in their own progress but also represents progress in the Canadian Society of Cost Accountants and Industrial

Engineers. News of the Incorporation of the Society of British Columbia will be received with a great deal of pleasure by the Officers and Directors of the Canadian and Provincial Societies and on their behalf, we wish to extend to the Officers and Directors of the Vancouver Chapter our sincerest congratulations on their incorporation.

In addition to their work on the Private Bill, the Vancouver Chapter has had remarkable success this past year in their increased membership and in the attendance at Chapter meetings. We wish them continued success and trust that in the near future the Society of Industrial Accountants of British Columbia will boast many new Chapters.

Annual Meeting

The Annual Meeting of the Canadian Society will be held in Kitchener on June 15th and 16th, the programme of which appears below.

The Committee in charge of the arrangements for the Annual Meeting have been very fortunate in securing Mr. L. L. Lang as the special speaker at the luncheon on Friday, June 15th. Mr. Lang is President of the Mutual Life Insurance Company, President of Lang Tanning Co., Past President of Canadian Manufacturers Association and is on the directorate of a number of other Companies.

Those wishing to attend the various meetings in Kitchener are asked to communicate with the Secretary, not later than April 30th to make reservations for hotel accommodation. Notice should be taken that members are cordially invited to bring their wives for whom special arrangements are being made.

Programme for Annual Meeting

Friday, June 15, 1945

Meetings to be held at the Westmount Golf Club, Kitchener

10.30 a.m.—Directors' Meeting.

12.30 noon—Luncheon and Entertainment.

Speaker — Mr. Louis L. Lang, President, Mutual Life Insurance Company.

3.00 p.m.—Annual Meeting.

6.30 p.m.—Dinner.

An itinerary will be provided for the ladies after the luncheon.

Following the dinner, members and their wives will attend a dance.

Saturday, June 16th, 1945

9.30 a.m.—Meeting of New Directors.

12.30 noon—Luncheon.

2.00 p.m.—Golf.

New Members

Kitchener

Lloyd C. Meyer, Waterloo Spring Ltd., Kitchener.

C. V. Hall, G. L. Griffith & Sons, Stratford. (Transfer from Toronto Chapter).

London

A. J. Green, 70 Graham Street, Woodstock.

Ralph B. Scott, Empire Brass Mfg. Co. Ltd., London.

John W. Long, Empire Brass Mfg. Co. Ltd., London.

James C. McIlvenna, Empire Brass Mfg. Co. Ltd., London.

Montreal

John A. MacDonald, C.A., E. C. Leetham, C.A.

Ottawa

Andri Chevrier, Ottawa Car & Aircraft Co. Ltd.

Toronto

Robert A. Norval, Joseph Simpson & Sons Ltd.

R. Frank Marchen, Swift Canadian Co. Ltd.

Alan H. Black, 428 Jarvis Street. (Transfer from Non-Resident)

Gordon F. Campbell, Exide Batteries of Canada Ltd.

Wm. F. Hubert, 1219 Shaw Street.

R. K. Roy, R.I.A., C. B. Taylor, R.I.A. (Transfer from Hamilton Chapter).

Wm. J. Stookes, Larned, Carter & Co. Ltd. (Transfer from Hamilton Chapter).

Vancouver

Donald B. Grant, Neon Products of Western Canada Ltd. (Transfer from Ottawa Chapter).

Windsor

Edmund J. Ogle, Canadian Industries Ltd.

Thos. Rochemont, Stokely Van Camp of Canada, Ltd.

Non-Resident

Wm. O. MacArthur, Aireon Manufacturing Corporation, Kansas City, Kansas.

J. G. Corkery, Aireon Manufacturing Corporation, Kansas City, Kansas.

R. L. Renner, Aireon Manufacturing Corporation, Kansas City, Kansas.

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Chapter Notes

Bay of Quinte

The Chapter was lead in discussion by two of its own members at its regular monthly dinner meeting on March 20th. Mr. Lorne McDougall spoke on the subject "Post War Planning for Belleville" and outlined the plan which the City Fathers had considered as post war development. It proved to be a most ambitious program.

Mr. Al Counsell spoke on "Rail Transportation of To-morrow". Mr. Counsell gave a brief graphic description of the tremendous job being done by the railroads in Canada and indicated some of the improvements which would be made to keep abreast of post war developments.

The next meeting of the Chapter will be held on Monday, April 23rd, when it is expected the members will be conducted on a tour of inspection through the new Bell Telephone Exchange.

Hamilton

A most interesting subject entitled "Application of Scientific Selection to Industry" was presented to the Chapter on March 15th by Mr. J. W. A. Fleury of the Stevenson-Kellogg Co.

Mr. Fleury gave a very enlightening and instructive talk on this very technical subject. The speaker gave a brief outline of the methods involved in scientific selection and an idea of the results which could be expected. Some differences of opinion resulted in a very lively discussion following the address.

On March 27th, the student section of the Chapter held its first meeting as an organized body with the Chairman, Bill Jones presiding. The topic for discussion was "Distribution of Overhead", lead by Mr. Rob Roy, R.I.A.

The next meeting of the Chapter will be held on April 19th, when Mr. A. J. E. Child, Assistant Secretary-Treasurer, Canada Packers Ltd., who will speak on "Internal Auditing".

Kitchener

The Chapter departed from its customary type of meeting on March 20th at the Granite Club, Kitchener. A large number of very interesting questions on Income and Excess Profit Taxes were submitted by the members. These were answered by Mr. J. G. Brown, C.A., in a very clear and concise manner and owing to the lateness of the hour, the question period had to be drawn to a close by the Chairman, Mr. W. L. Jardine, R.I.A. A few questions were also submitted on "Cost Accounting", the answers for which were supplied by Mr. C. R. Kidner, C.A., R.I.A.

Niagara

The Chapter had a well attended meeting on March 21st when Mr. Rob Roy, R.I.A., of Hamilton, spoke on the subject "Distribution of Overhead". Mr. Roy pointed out that accountants generally took the line of least resistance in the matter of distributing overhead, and which resulted in many inconsistencies which could be detrimental to their Company. Mr. Roy introduced some new thoughts on overhead distribution which created a great deal of discussion.

CHAPTER NOTES

The Acting Chairman, Mr. F. E. Poynton, announced that their genial Chairman, Mr. L. C. M. Palmer, C.G.A., R.I.A., was leaving their midst to take up duties with The Parchment Company, Spanish River, Ontario. Unforunately, Mr. Palmer was unable to be present owing to illness but the Secretary, Mr. A. M. Chesher, received on his behalf a handsome brief case.

The next meeting will be held on April 18th when Mr. H. W. Spry, R.I.A., of Toronto will speak. Mr. Spry is a Past Chairman of the Chapter.

Toronto

On March 14th, members of the Chapter met at 3 p.m. to make a tour through the plant of the Viceroy Manufacturing Co. Ltd. This plant visit proved to be a very interesting experience as they absorbed many of the varied processes in this plant of diversified products. At the meeting which followed, the Officers and Directors were elected for the following year. Mr. Hugh MacDiarmid announced that plans had been completed for the Annual Ladies Night which would be held at the Old Mill on Wednesday, April 25th.

The Student Section of the Chapter held its meeting on March 28th for their final dinner meeting of the season. The subject for discussion was "Application of Overhead" and was led by Mr. R. K. Roy, R.I.A. The discussion showed that the members were on their toes and followed the remarks of the speaker with interest.

The following executive was elected for the year 1945-46: G. Mason, Chairman; K. Hume, Secretary; B. M. Smith, H. Jordan, C.A., F. B. Thickett and S. W. Duxbury.

Calgary

The Chapter held two meetings during the month of March. The first was addressed by Mr. C. Raeper, R.I.A., of the McColl-Frontenac Oil Co. on the subject "Marketing Costs in the Oil Industry".

The second meeting was held on the 28th of the month when a panel discussion was held by members of the Chapter on the subject of Depreciation. Mr. J. Randall, R.I.A., acted as Chairman and began the discussion with the definition of Depreciation. Mr. R. Scott, R.I.A., then led the discussion from the standpoint of direct cost. Mr. Lloyd McPhee, R.I.A., took the subject of Depreciation Accounting and Pat Bowsher, R.I.A., spoke on "Depreciation for Income Tax Purposes."

Windsor

The Chapter held its regular monthly meeting on Thursday, March 22nd, at the Norton-Palmer Hotel. The speaker of the evening was Mr. B. F. Jackson, B.A., M.B.A., CP.A., of Price, Waterhouse Co. The subject of Mr. Jackson's address was "The Auditor and The Cost Accountant". He began his address by stating that the cost accountant should be called "Industrial Accountant", having analytical and practical knowledge of all phases of productive capacity. As such, they make good auditors and assist to no small degree the work of the Public Accountant. In the outline of the many duties of a public account, the speaker pointed out how the quality of the industrial accountant's efforts were reflected in the final results obtained by the auditor.

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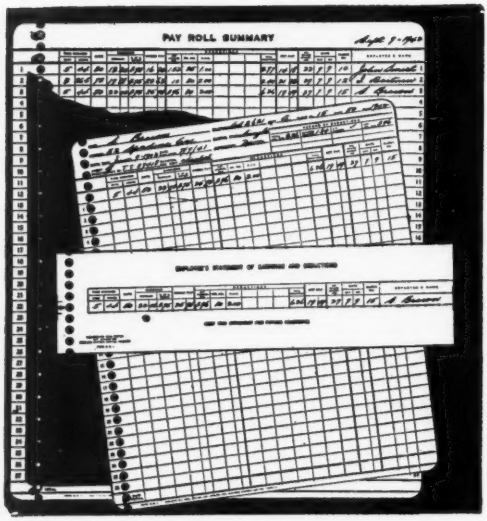
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Current Literature Review

PREPARATION FOR WAR CONTRACT TERMINATION

This is a very instructive paper presented in the March issue of the Canadian Chartered Accountant by E. F. O'Brien, C.A., dealing with a subject that is a cause of grief and confusion to many accountants. A number of suggestions are offered in preparing for the contract termination which will simplify matters considerably for the contractor in securing settlement and streamlining the transition from war contracts to peace-time production.

It is pointed out that one of the basic requirements in making adequate preparation for War Contract Termination is the formation of a termination committee. This committee would consist of the representatives of those departments which would be required to supply essential information. The first function of this committee would be to become completely familiar with the manual of procedure of termination of contracts prepared by the Department of Munitions and Supply and with the forms required to be filed. The author describes much of the ground work that can be laid by such a committee in preparation of contract termination.

REAPPRAISAL OF WARTIME RESERVE PROVISIONS

This timely article prepared by E. B. Wilcox, Partner, Edward Gore & Co., Chicago, Ill., is published in the N.A.C.A. Bulletin of March 1st. The author has indicated various reserves which have been born of wartime necessities. As is stated "they are for accounting not financial purposes. They are not designed as a basis of funds to be established for post-war financing."

The article describes some of the misuses of special reserves and the danger which accompanies such practice. He goes on to suggest the proper treatment of adequate reserves in the light of present day conditions and post-war contingencies.

Cost Accounting and Control in To-Morrow's Competitive Economy

By WILLIAM E. JACKMAN,
Accounting Supervisor, Eastman Kodak Company,
Rochester,, New York

My topic, "Cost Accounting and Control in To-morrow's Competitive Economy," indicates my belief in a competitive market to-morrow. There are many factors now working in the world, which will play an important part in creating an economic activity far beyond our present ability to comprehend or appreciate. The physical volume of trade in the world is dependent on mutual resources, invention, and research, free enterprise and technological developments, in the production field, well trained and

well treated manpower and effective distribution. Based on our experience during these days of conflict, it seems certain that new-found sources of supply of many natural resources, the inevitable war stimulus to invention and research, our unswerving determination to retain free enterprise and make use of advanced technology to achieve greater and cheaper production, the realization of the dividends arising from good training programs and fair treatment of employees, and new and cheaper methods of transportation and distribution, can but lead to a substantial increase in the volume of exchanges throughout the world to-morrow.

In addition to these positive stimuli to a greater volume of trade, are the present negative factors of severe shortages in consumer and certain goods, a marked deficiency in adequate housing facilities in most countries, and a definite need for capital to effect a broad program of reconstruction and rehabilitation throughout the world.

Another factor, which will play an ever-increasing role in trade development is the growing tendency to international mindedness. Whether you believe in it or not, you are going to find that the mixing of large volumes of our manpower with men of other nations on a common field of battle has gone far to develop a high degree of international friendship and appreciation, which coupled with the effect of rapid and cheap air transportation may well bring within the span of your life and mine, a realization in the highest terms of our late Mr. Wilkie's dream of "One World."

But make no mistake about it. Competition will be keen in this post-war era, both in domestic and export markets. No doubt, there will be some forms of restraining legislation and regulatory practices. No doubt international cartels disguised by some less offensive name will again come into being. It is difficult to believe, however, that competition will not reach its highest development in the post-war era, and please don't forget that in world markets you are going to have some new competitors before very long. It probably seems fanciful at the moment but the day is not far distant when manufacturers in the Soviet Union, China, India, and South America may be bidding against us for business.

Well, what part does cost accounting and control play in the drama of this new era? If you and I have vision, they may well play a leading role and be a vital determining factor in whether we build an expanding economy, which will endure or whether it will merely be a flash across the horizon and become a burned ember instead of a pot of gold at "the end of the rainbow." Cost accountants have an opportunity and a responsibility to provide their respective managements with real tools for control. Management has the most serious responsibility ever faced by industrial executives to preserve free enterprise, to provide more jobs for more people and to produce fair earnings on invested capital.

Let's look at some of these tools of control which we must have for effective cost accounting and sound management results. For our convenience, let us look at them from the standpoint of both a long-range and a short-range classification. Under long range let us deal with tools effective for three to five years ahead. Beyond five years, we are inclined to feel we are verging on the speculative. Under short range we deal with tools effective from day to day and for a year ahead.

Many businesses have refused to do any "crystal gazing" or prognos-

tication. While forecasting is far from an exact science, we predict that such enterprises as refuse to take a long forward look now, will be faced with deep regret five years from now. A series of hypotheses must be assumed ranging from a minimum to a maximum for certain important factors in the business. Basic data can be based on surveys, market studies, research, statistical indexes or even broad guesses tempered by valid experience. The cost accountant should closely ally himself with the research dirctor, the engineer, the production manager, the sales manager and any other executive who plays a vital role in operations. The long-range plan should be the best product possible from the minds of all these men and should deal with the following factors:

1—Sales.
2—Gross Profits.
3—Distribution and Administrative Expenses.
4—Net Profits.
5—Investment in Durable Assets.
6—Investment in Inventories and Receivables.
7—Current Liabilities.
8—Financial Policy.

We shall not deal with some of the factors mentioned as their relative value to the over-all plan is well known to each of you.

The technique of long-range planning is to assume several reasonable levels of volume both from a standpoint of physical units and dollar volume. Project each of the factors at the varying levels, using past experience adjusted for the best estimate of future trend or changes in policy or organization. Don't try to be too precise but rather be practical and broad in your assumptions.

May we stress several points under distribution and administrative expense. We have heard for years that the cost accountant should study and develop accurate distribution costs for management and everytime we have a general survey of what has been accomplished in this field, our hearts do not swell with justifiable pride. At a recent conference, it was suggested that if management would develop an adequate and good system of distribution, the accountant could then provide costs as accurately as he has for manufacturing operations. Well in long-range planning, we suggest that the accountant and sales manager really find out "where they've been and how much it cost" and make a blue print of "where they're going" and estimate the cost of a "one-way ticket."

We also suggest that a comprehensive program of research and development be planned and adequate financial provision be made for such a program. If you don't progress in new product and design, your competitor who does will surely "steal the show."

We recommend that under Administrative Expense some provision be made for a simple effective long-range program of employee training. Also don't forget the field of public relations. Careful planning here may yield immense dividends in public good will and prestige.

You must give careful thought to the provision of facilities to meet your projected levels. Present inabilities to secure needed machinery and equipment may be followed by a hectic period of waiting unless you have planned wisely and have fully specified orders ready to place for delivery,

when releases are possible, or even have them in the supplier's hands awaiting V-Day.

Such a long-range forecast as we have outlined will prove a most valuable tool to management in sighting shoals before the ship strikes and in planning corrective measures to avoid difficulties. It will be a screen on which to project the short-range controls to see how they conform to the pattern of the longer-range plan.

Perhaps several of you may wish to add to our list of short-range tools or controls, but for our consideration, we would like to consider briefly six basic tools.

The basic tools are:

1—Sales Budget Control.
2—Production Budget Control.
3—Standard Cost Control.
4—Expense Control.
5—Accounts Receivable Control.
6—Capital Expenditure Control.

Please note that we have expressed each of the basic tools as a control. Control is sometimes defined as restraining, governing or regulating. For our part, we like the term regulation as it implies method and order. Each of the basic tools involves use of orderly methods and techniques to achieve a desired result.

The Sales Budget or forecast may be developed from a statistical analysis of past experience or from an analytical approach. While the latter method may offer more flexibility, it is usually less successful, as many businesses are not blessed with sufficient knowledge of their industry and statistical tools, or a familiarity with broad economic principles to build a workable forecast. However, the cost accountant can analyze past sales experience by product lines, by sales territories, and by customer class. Such analysis should be made in terms of units and not dollar value. Graphic charts should be developed eliminating long-term and seasonal trends, and a correlation made with some good index of general business. Having established an index of deviation from normal for the company's sales compared with the deviation from normal of general business, you have a formula for developing a sales forecast each year, once that general business level has been estimated. Be sure that there is close cooperation with the sales manager, so that the effect of any proposed changes in policy or method may be taken into consideration. Be close enough to the research and development program to know its probable effect on sales.

Current monthly performance should be measured against the budget and major variances should be analyzed. It is the definite responsibility of the cost accountant or controller to measure the effect of changes in sales policy and method on cost and net profits. While the preparation of a sound Sales Budget usually means hours of hard digging and statistical study, this tool properly used may become a "life saver" in the days ahead.

Once the Sales Forecast or budget is established, the cost accountant has another group of men to deal with, i.e., a Production Budget Committee consisting of representatives of the Manufacturing and Production Planning Departments, Purchasing Department, and Sales Department.

This group must determine what products shall be produced, how much to produce of each product and the time it shall be fitted into the schedule. One of the most serious responsibilities of this group should be a review of the capacity of plant and equipment in relation to the planned production. During this review, make sure that additions and improvements are carefully considered and such information made available to those who will control capital expenditures.

Labor loads should be carefully established with a view to providing steady employment to the most people possible. While we are fully aware of the balance which should be considered between the maintenance of minimum inventories and the stabilization of production, we feel that the latter may offer the greatest net return in to-morrow's market through reduced labor turnover, improved employee morale, less overtime cost, reduction in fixed charges and better utilization of supervisory and staff personnel.

The Purchasing Department representatives must assist in scheduling material requirements, giving close attention to the trends in raw material prices, the availability of raw materials and probable length of delivery, warehousing raw materials, etc.

The cost accountant must analyze and interpret these unit budgets and plans as cost of production and cost of sales budgets, so that cash requirements may be determined and a profit and loss forecast made. If he has a standard cost system, this is comparatively easy.

This committee should also establish budgets for inventory control and compare actual performance with budget so that management may be advised of any necessary corrective measures.

Perhaps many companies have tried this tool to a greater or less degree, but their experience has usually resulted in the development year by year of new and more accurate techniques. You decide for your own company to what degree this tool should become a high precision tool, but don't fail to use it.

We have spoken of two types of budgetary control for setting an objective for certain functions of a business. Both of these involved the idea of predetermination instead of historical reporting. If such a basic fundamental approach is good for the sales manager, the production manager and the purchasing agent, it certainly can be an effective tool for the cost accountant in reporting costs of operation to management. In this case, the tool is called Standard Cost Control. It consists of determining the cost of a product or service before the work is undertaken. It involves the setting of three kinds of standards:

(a) Material standards through careful specifiaction and selection of material.

(b) Labor standards through time and motion study of each operation and analysis of labor rates.

(c) Expense standards through engineering studies of facilities and equipment and indirect services required to produce the product.

Standards should be set as reasonably attainable goals at the level of business anticipated so that debit or credit variances will represent deviation from:

(a) The usage factor or labor efficiency.

(b) Predicted purchase price of material or labor.

(c) Expected volume of production.

Setting material standards involves a careful engineering study of the kind, quality, and quantity of raw material for specific parts and assemblies. In determining usage factors, careful attention must be given to scrap, waste, and shrinkage. Of course, a prime requisite of setting good standards is an adequate physical control over procuring, storing, handling and issuing of material.

Setting labor standards involves a selection of the best operating methods available. All conditions influencing the effectiveness of the operator should be standardized. This involves careful study of layout, equipment, work bench, material availability, routing and dispatching work and operator training or direction. Time and motion study must be employed to determine the time needed to complete each operation under standard conditions. Classifications of grades of labor, setting standard rates of pay for each grade, consideration of the effect of the wage payment plan used must all be considered in setting the labor standard rate. Here again the cost accountant must see that the plant has an adequate and effective time keeping and payroll system so that data provided management will be a reliable guide for action.

Expense standards are set up to localize and control expenses. They must therefore involve an engineering analysis by production and service departments. Service costs are assembled and charged to productive departments. You will find that in many departments conditions are not at all uniform and rates must be established by cost centers. Expenses must be separated as between fixed and variable so that it is possible to analyze increases in unit cost as noncontrollable or controllable. A level of activity is determined and fixed or stand-by costs set for this level. Here the accountant must work closely with the manager and departmental heads to insure reasonableness in the standards set.

Standard costs once set should only be changed when there are sufficiently significant changes in the elements of the standard so that it no longer represents a good measuring device of performance.

Having established standard costs for material, labor and expense, differences between actual costs of these elements and the number of units of product produced times the standards are taken up in variance accounts. This expresses variances in dollar amounts and usually focuses management's attention on spots needing managerial action.

While there are many advantages in using the tool of Standard Cost Control, we shall only emphasize several, which will be of paramount importance in post-war years.

(a) Tney will aid in standardizing products, methods and processes.

(b) They will simplify and provide cost information more promptly.

(c) They will provide chaflenging objectives to all divisions of the business.

(d) They will assist in predicting net profits.

(e) They will aid all executives in doing a better job of controlling. through concentration on exceptions.

If you are not using this tool of effective business operation, may we suggest that you give its use serious consideration.

The tool of Expense Control or creation of flexible budgets representing the best measure of what expense should have been at a given activity level compared with what it actually was, is in common use. Control is best accomplished at the source of expense, and the foreman who exercises control should be given data in the form he will best interpret. Therefore, we recommend you read some recent interpretations of the use of physical units instead of dollar values in operating budgets .

We advocate the use of Expense Control as an aid in budgeting Distribution and Administrative costs. Here again, don't lose sight of the analytical and engineering approach used in setting standards. Study and plan salesmen's routes carefully. Don't have them call twice a month when the potential sales volume only warrants a monthly call. Analyze warehousing and shipping methods thoroughly. And be sure your budgets are set up by both territories and product lines.

When we are in a highly competitive market, the conflict between the Credit Manager wishing to collect accounts promptly and the Sales Manager, who wants to sell all possible merchandise, becomes acute. Management must set a policy as a guide to both and then the cost accountant should set up a budget of the amount of receivables anticipated by months after careful determination of the average collection period. He should check actual results against this budget, for excessive receivables may seriously affect the cash position of the company. The accountant should also budget credit losses based on past experience, general conditions and a knowledge of any special conditions, which may affect the accounts.

Capital Expenditure Control is going to be a most important tool for you prior to and during the post-war era. You purchase facilities either to produce new or better merchandise or to reduce cost of what you are now producing. If you don't have a sense of liberality in buying new machines for the first season, you will probably lose both market and profitable opportunities. You can afford to be somewhat cautious in expenditures for the latter reason as delay merely involves greater expenditure for current costs instead of capital assets. Here again, each division should have at least a quarterly budget of required expenditures carefully setting forth the reason for the purchase as

(1) Production of new product.
(2) Production of improved product.
(3) Replacement of existing facilities.
(4) Production of greater volume.
(5) Reduction in costs by change in machine.

All this information should be carefully reviewed by the engineer, purchasing agent, production manager, cost accountant and general management and no purchases should be made unless approved by this committee. The accountant must watch to see that working capital is not seriously impaired by expenditures in excess of depreciation charges. He is also interested in any cash receipts which may arise from the sale of capital assets.

We have not attempted to go into technical details regarding these six basic tools but rather to spotlight them so you may see advantages in their use in your own business. They may look formidable and perhaps you feel awkard about trying them, but please remember every good

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mechanic becomes expert only through a thorough knowledge of the material on which he works and the equipment he uses to produce a finished job. As accountants, we should become just as expert in using the basic tools of good management.

May we digress from our topic briefly to call to your attention a factor which may conceivably nullify the desirable results, which can arise from the use of good tools of control. This is failure to make a critical analysis of "economic laws" in the light of Christian principles. We have had ample demonstration of the unstable conditions which arise when large masses are not profitably employed and the inevitable result upon industrial life and society as a whole. We must arrive at a method of long-range planning and control both within individual countries and on a basis of international co-operation, so that these evils do not again plague the world. This can be worked out on a broad Christian basis, which will still permit of a competitive economy, but only when you and I put moral order under God at the center of our individual daily lives, and wake up to the fact that with Divine help we can change the course of the stream of human events.

Modern Internal Auditing and Its Relationship to Industrial Engineering

By JOHN B. THURSTON

(Reprinted from the Internal Auditor)

FACTORS LEADING TO INEFFICIENCY

The American war effort has bred both efficiency and lack of efficiency in American industry. Let us examine this paradox.

Lack of efficiency has resulted from a number of things such as the psychology of "Damn the torpedos; full speed ahead;" many millions of men and women were put to work on jobs completely new to them; for the first time many manufacturers produced products they had never produced before; the fear that unless businessmen maintained voluminous records, they would be penalized severely by the government; the amount of red tape that the government imposed on business; in many instances men have stood still unwittingly allowing their companies to outgrow them; the rather prevalent psychology of "Why worry about spending the money? The government pays for it anyway"; and this is most important, excess profits taxes have warped the thinking of many, many executives into a point of view where they say, "Sure, spend the money. Uncle Sam pays eighty percent of it. It only costs us a mere twenty percent."

All of us should be concerned with this situation, since it might lead to an inefficient America. We might find ourselves on the same economic rocks of inefficiency that wrecked much of Great Britain's economy in the past twenty or thirty years. Let us guard against it.

Factors Leading to Efficiency.

The picture we have just painted is a pretty black one. But if

that were the only side of the picture, we would not be on the Island of Leyte in the Philippines to-day, nor would we be on the so-called "Holy Soil" of Germany. The paradox is that in spite of all the inefficiency in our war effort, America has produced the goods. And it has produced them in vast quantities at increasingly lower costs. Despite the inefficiency in many companies and in many circumstances, efficiency has prevailed in other companies and in many other circumstances. Thus, American production is winning the war—efficient American production. This efficient production has resulted from many things: over the years immediately preceding the war —yes, and during the war years—management techniques have been improved; new materials have been introduced permitting cheaper, faster, or more efficient production of goods than was possible with older material; the development of new production machines which do the job of five or ten machines before the war; the developments in chemistry, such as electronics being put to work on the production line sorting good from bad products—making inspection scientific in many circumstances where it was only empirical before; the billions of dollars poured into new facilities—buildings like Willow Run, and the mammoth aircraft factories on the west coast, with which buildings, management has been able to establish production lines and proper plant layouts which would have been impossible in old, outmoded factories; the casting aside of petty commercial jealousies and rivalries by manufacturers who have freely interchanged trade secrets and patents; where management has been progressive and where labor has been intelligently led, labor and management have cooperated in many areas to get results; and, I like to believe, most importantly, there have been developed the twin techniques of internal auditing and industrial or management engineering. In a sense, these are interwoven in the first item mentioned, namely, developments in the art of management. However, both internal auditing and industrial engineering have shot to the forefront in prominence in the management field during the war period and, in recent years, in such a spectacular fashion as to over-shadow most developments in the area of management techniques. So I want to talk to you to-night about these two techniques as modernly conceived and practiced, and to point out just how they mesh together and make possible maximum production at lowest cost.

Internal Auditing

Let us look at internal auditing first. There is no question but that internal auditing, as modernly conceived and practised, is suffering under a bad misnomer. Internal auditing is no longer the narrow checking operation it was in the past. To-day, internal auditing is recognized as the examination of the functioning of an organization by one or more of the organization's own officers or employees for the purpose of determining whether or not established methods, policies, procedures, and practices are being followed, and whether they are being followed both effectively and efficiently.

Let us be clear on this point: Internal auditing is not auditing as usually understood. Auditing is usually understood to mean the science of verifying the records and reports which reflect the financial condition and operating results of a business.

Internal auditing, on the other hand, is a much broader activity. While

auditing as generally understood—and as just defined—is one of the activities of the internal auditor, his work is not confined to just that. The internal auditor's job, in addition, embraces surveys of operations and personnel as well as the review of accounting and other data and records. In fact, routine auditing is, in many instances, the least significant part of the internal auditor's work.

Only in the very recent past has internal auditing been recognized in its true light—as an arm of top management. To-day, those who understand it, recognize it as a technique for providing top management with many important facts it would not otherwise have; for insuring adherence to budgetary standards; for securing observance of company policies; for establishing adherence to laws, regulations and contract terms by officers and down-the-line executives; for calling attention to the inadequacy of many types of physical property and to the lack of propriety in their use; for weeding out incompetent personnel and for highlighting talent; and for following up the work of the industrial engineer by seeing that new methods, procedures, and practices, once installed, are maintained.

Let me emphasize here that this description of internal auditing is not just theory. This is modern internal auditing as practiced by many of our leading corporations. This is modern internal auditing as recognized by men scientifically trained in management, men with whom rule-of-thumb managers will never catch up.

It is an established fact that chief executives trained in modern management methods expect the internal auditor to perform these functions for them:

1. Inform them of important facts;
2. See that policies established by the management are adhered to;
3. Ascertain that controls—managerial and accounting—are functioning properly; and
4. Verify the accuracy of financial and statistical reports.

Industrial Engineering

Now turning to industrial or management engineering, let us first of all recognize that it is relatively new. While its roots go back to Harrington Emerson and Frederick Taylor—men of the last century—industrial engineering only began to grow with and after the last war and to increase progressively in stature during the expansive twenties and contractive thirties. It is my firm conviction that it will grow increasingly rapidly in importance from now on.

Industrial engineering owes its development to the application of scientific methods to business management and to the expansion in applied business research which followed the first world war. During the last few years, just as professional management engineering has grown in stature and become widely recognized and accepted as a principal tool for supplementing successful management, so too industrial engineering conducted within corporations has been experiencing a parallel growth.

Nathaniel W. Barnes, Executive Secretary of The Association of Consulting Management Engineers, has written a monograph on management engineering which is very helpful in understanding that activity. In it he states:

". . . This young profession owes most to what is known as the

'scientific management movement.' . . . Steadily the management engineer has broadened the scope of his work, until to-day it extends to all problems of business management. It includes not only the improvement of production and sales techniques, the development of financial and executive controls, and the review of management policies, but also consideration of such controlling factors and elements as: the structure of the administrative and operating organizations; the selection, training, direction and remuneration of personnel; the forecasting of demands and needs; the planning of activities and the budgeting of resources; the collection and maintenance, in the most economical way, of the most helpful control records relating to operating and distribution costs and results; the establishment of standards against which to measure progress in economy, in quality, and in service; the improvement of industrial relations; and the utilization of intelligent research and development procedures."

The duties of the company industrial engineer parallel closely the activities of the professional management engineer as described above. The duties of the company industrial engineer follow:

1. To assist management in the solution of managerial problems by fulfilling the same role as the company lawyer in the solution of legal problems, the controller in accounting problems, the aeronautical or other engineer in engineering problems, the cost accountant in cost problems, and so forth.

2. To assist in developing and keeping up-to-date the organization structure of the executive, administrative and operating units of the company.

3. To assist in developing, maintaining, reviewing, and controlling corporate policies.

4. To ascertain and activate ways and means of reducing expenses and eliminating waste.

5. To establish standards against which to measure progress in economy, quality, and service.

6. To simplify or otherwise improve equipment, procedures, and methods.

7. To forecast the demands and needs of the company, to budget resources, and to assist management in the planning of its activities.

8. To develop, review or maintain management controls when need for these arises; and to collect, interpret, digest, correlate and maintain the most helpful managerial control records.

9. To ascertain that all essential activities are provided for, particularly as the business grows in size and complexity, and to make sure that responsibilities assigned to individual executives do not become too burdensome when such growth occurs.

10. To assist management in the selection, coordination, and control of executive personnel.

11. To develop and maintain wage and salary incentive plans.

12. To keep management informed, at all times, of the most advanced thinking on problems of managerial control, and to recommend ways and means of inaugurating new methods or techniques wherever these are applicable to the company's operations.

13. To keep abreast of changes in managerial philosophies, and to devise and develop new management methods.

14. To furnish necessary liaison with professional industrial engineering counsel on major management problems having broad scope or unusual aspects.

All of the foregoing are ways in which successful management can be supplemented by intra-company industrial engineering. These functions are important means for obtaining and maintaining control over costs, for establishing efficiency throughout all operations, for supplying top management with factual information, and for providing assistance in solving managerial problems.

Let us enlarge on the foregoing, since each is not readily understandable without some further discussion.

One of the important control media placed in the hands of the industrial engineer is the control over organization. Control over organization and organization structure is one of the oldest recognized forms of corporate control. Since organized problems relate to and dovetail with most industrial engineering responsibilities, it is logical to focus the responsibility for organization control in the industrial engineer. Closely tied to this matter or organization are such important matters as space and space layout, and executive personnel.

Also of great importance in controlling corporate activities are the ideals, objectives, and policies of the enterprise. These must be clearly stated, promulgated and understood if the most efficient and effective results are to be obtained. Again, centralization of this responsibility in the industrial engineer is logical because of its close relationship to other managerial control problems.

Of major importance is the methods engineering phase of industrial engineering. This has many facets, and some or all of these are found in some companies in divisions or departments bearing such titles as standards, work simplification, industrial engineering, methods, and the like. Methods engineering is a relatively new managerial technique not widely understood because of its comparatively recent developmnt, particularly in relation to executive and administrative methods and procedures.

Let us define methods engineering as a technique that subjects each activity or related group of activities to close analysis in order to eliminate every unnecessary operation and in order to determine the quickest, cheapest and best method of performing each necessary operation.

Put another way, methods engineering is the means for establishing exact requirements as to facilities, machines, and manpower. By employing methods engineering techniques, determination can be made of space requirements, equipment requirements, time requirements, manpower requirements to carry on every given activity or related group of activities. Methods engineering includes procedure analysis, motion study, time study, setting up of factual bases for incentive purposes, and the like.

Standards are directly related to methods engineering. The organized use of scientifically determined standards, while of relatively recent origin, has become widely recognized as a valuable managerial tool. After studying each element of a man's work, each machine, and each process or operation, and eliminating undesirable features, standards can be set up by which

results can be measured and managerial control thereby established or bettered.

Simplification is still another result achieved through methods engineering. Simplification is applicable throughout the company to procedures, work methods, furniture, fixtures, office machines and other practices. Simplification necessarily precedes standardization.

Control over office and shop equipment is another responsibility of the industrial engineer. It has been found desirable in well-managed companies to focus in a central staff agency the responsibility for the review of the kind and quantity of new appliances, furniture, fixtures and other shop and office equipment to be purchased (not including technical equipment that only technically trained men are qualified to judge).

The foregoing discussion is not all-inclusive, but sufficient, I believe, to acquaint you with principal industrial engineering functions in a modernly organized corporation.

The Relationship Between Internal Auditing and Industrial Engineering

The relationship between internal auditing and industrial engineering is this: both are major management control techniques. Not only that, but the work of one complements the work of the other. If you will permit me to over-simplify, the industrial engineer determines the one best way to perform a given function, and, with the corporate executive involved, establishes that one best way. It is then the duty of the internal auditor to see that the one best way is followed. In other words, the internal auditor polices the work of the industrial engineer. Without this policing, the industrial engineering work may not continue to be fully effective.

There is another major area where the work of the internal auditor dovetails with that of the industrial engineer. One of the primary goals of internal auditing is to call attention to inefficiency and waste. One of the primary goals of the industrial engineer is to eliminate inefficiency and waste. In other words, the duty of the internal auditor is disclosure, while that of the industrial engineer is solution. Where these complementary functions are properly correlated and harnessed together as a team, the most far-reaching results can be achieved.

A principal function of the internal auditor is to appraise through the means of periodic surveys—to observe and disclose all faulty situations of whatsoever nature as they occur or are discovered. On the other hand, it is the job of the industrial engineer to correct these faulty conditions. That distinction in duties—between the duty of disclosure and the duty of correction—is of primary importance. Let us sum up as follows: the internal auditor is not responsible for developing remedial measures; the industrial engineer is.

In conclusion, I want to emphasize the importance to American Business of the new corporate techniques we have discussed to-night—industrial engineering and internal auditing. Where a company has inaugurated these activities, where proper reporting responsibility has been established, and where a good man has been placed in charge of an adequate staff, that company is in an enviable position to face the post-war transition era firm in the knowledge that production will be carried forward at high and efficient levels.

Neither you nor I would be realists if we failed to recognize that, with post-war adjustment, there are going to be many corporate casualties. Many companies are going to collapse into bankruptcy. In some instances, bankruptcy will be entirely due to a cessation of war demand, introduction of new and supplanting products, or other uncontrollable factors. However, in most instances, corporate failures will be due to poor management. And only poor managements will fail to recognize what industrial engineering and internal auditing could do for them.

The need for action now cannot be emphasized too strongly. Now is the time to establish efficiency and economy in your operations, not at some vague, future "V-Day." Now is the time to adjust your thinking to this fact: that your company may be knocked out of war production tomorrow. Now is the time to recognize that your company may be so laden down with war fat that it will waddle into bankruptcy unless that fat is trimmed off—and trimmed off soon.

As the new techniques of internal auditing and industrial engineering are tested in the crucible of everyday business life, it is believed that they will more effectively strengthen the structure of corporate management against attrition from internal neglect—strengthen management to such an extent that it can weather the worst foreseeable economic storms.

In coming before you to-night to talk of internal auditing and industrial engineering, I hope that I have brought you a few new thoughts. My hope is that by calling your attention to these new management techniques, they will become more generally acceptable and more widely adopted by you and by modern business management generally.

It is my hope and belief that by adopting these and other new management techniques, American Business can be made more efficient, that more jobs can be provided after the war, and that America can become an even more economically healthy nation to live in than it has been in the past.

Costs in the Aircraft Industry

By R. E. LLOYD, B.Sc.
Chief Cost Accountant, Canadian Vickers Limited, Aircraft Division,
An Address Before the Montreal Chapter

"Costs in the Aircraft Industry" is the subject for to-night. Appropriately so, because it is an acknowledged fact that the growth of Canadian Industry has been phenomenal in this present war era. It has been purchased with the untold misery and horror of our own fighting men, while you, on the home front, have contributed with your efforts. Paramount in this upsurge has been the expansion of our Canadian Aircraft Industry. None of this would have been possible without vision and inquisitive aggressive thought. Societies, such as your own Cost and Management Institute, have been leaders in these Fields. None of these new phases of industry could have been possible without the capable service that you, as individuals and a society, are continuing to render. Your executive, in their wisdom, have felt that perhaps something can be learned or gained from the correlative costing methods presently being used in the aircraft

industry. In inviting me to speak on the subject "Costs in the Aircraft Industry", they have endowed me with an honour that is whole heartedly appreciated.

In the time allotted to-night, it is not possible to consider more than a few outstanding phases of the title.

If costing in aircraft is a success, it is because the systems used, are grounded in their simplicity on the natural requirements of management, and because they are based on the actual physical construction of the aircraft.

From experience, it has been found that a practical method of costing aircraft is to cost in batches. This is normal, as each batch is governed by the average quantity of aircraft completed in a calendar month, or an accounting period. The value of this is at once apparent, as it enables the Cost Accountant to prepare statements showing the cost of the batch completed at the end of each month, or to prepare statements showing the trends of cost from batch to batch or month to month. At this point, the Cost Accountant can make a comparison of the actual direct labour from batch to batch, with the projected direct labour up to this point as set down by the industrial engineer. With the Cost Accountant's experience of the variation in the industrial engineer's estimate, this forecast of direct labour, as compared to labour standards, can be carried to the end of the contract. In other words, with his sure knowledge of material costs and a good control of expenses, the Cost Accountant, by batch, can achieve, the ultimate in Costing in that he can estimate, very close to actual, the total cost of the contract.

It is a matter of record, that a number of contracts for aircraft have been drawn up and the price fixed when only a few of the total number of aircraft to be manufactured on the contract have been completed. From this instance you can readily understand that the Cost Accountant who can accurately forecast the cost of the aircraft, batch by batch, over the entire contract, becomes a very valuable asset to management.

Similarly, it has been said that the costing system is successful because it is based on the actual physical construction of the aircraft. Now, obviously, the batches, whereof we speak, are composed of a number of individual aircraft. Each ship is built up from a number of major components, such as: wing, fuselage, tail, etc. In turn, the major components are built up from a number of sub-components. For instance, to build a wing you must assemble the leading edge, the trailing edge, the outer wing panel, the aileron, etc. By the same method, the sub-component is fabricated from a number of detail parts, and, of course, the detail parts are manufactured from individual pieces of raw material.

It is easily seen that it would be impossible to cost aircraft, especially a large aircraft, from detail parts, because there could be as many as 30,000 of these individual pieces even after excluding the standard parts, such as bolts, nuts, rivets, equipment, fittings, etc. Picture for yourself, the impossibility of merely recording the timekeeping for such a vast number of details. The record would soon become inaccurate and the costing useless. Therefore, and again from experience, it has been found that it is not necessary to breakdown the cost of an aircraft into more than 125 sub-components.

However, if on occasion the cost of any detail part is required, it can be costed, satisfactorily, by using the labour standards for the sub-component, in which the detail is included, and applying the variation between the actual cost of the sub-component and the labour standards for that sub-component. The value of the raw material in the detail part is calculated by reference to the bill of material.

And this gives you the overall picture, ladies and gentlemen, consisting of—the complete total cost of the contract—batches—airships—components—sub-components—detail parts—raw materials—and the whole bound together and catalogued by the bill of material.

Before proceeding, mention should be made of one of the major factors that can upset the batch cost accounting system. Practically every contract for aircraft carries with it one or more contracts for spares. Too often it is found necessary to borrow assemblies and parts intended for the production of complete ships and relegate them, or ship them out, as spare parts on the spares contracts. It has been found that the difficulty can be overcome by originating an absolute, separate area, or store, to contain spare parts only. Upon completion of the parts originally manufactured for the spares contracts, they are moved directly into the store. From the store, they are shipped off against the spares orders directly to their outside destinations.

Now here is the main difficulty and its control. When an emergency arises, where the spare called for is not contained in the area, it may be necessary to borrow the similar part from production. An advice note must immediately be sent to both the Cost Accounting and Production Control Departments, setting forth all the details of the loan. With this information, the Cost Accountant can credit the main aircraft contract with the cost of the particular item, and, in turn, debit the spares contract. The Production Control Department, upon receipt of their copy of the same advice note, issue a work order to the factory for the item and it is earmarked as a replacement to the main contract. By the same token, the recall is at once placed on any order which may have been issued previously for the same item on the spares contract. However, it may conceivably happen that the item in question, on the spares contract, has been issued to the factory and manufacturing has already started. Again, the Production Control Department must so advise the Cost Accountant. In this case, no entries are necessary or made between the main and spares contract, but the Production Control Department must advise the spare stores area to return the item to production as soon as it is received.

To summarize the foregoing explanation, the main danger to the costing system lies in the need of borrowing from production to satisfy the necessity for spares, and the danger is complicated in increased ratio by the additional numbers of spare contracts. It is found that the solution lies in the emphatic control of the borrowings at all times. The penalty for the lack of such a control is that it will not be possible to cost any of the spares contracts until all the airplanes on the main contract are completed. That is, if you do not have the essential policing of the borrowings, you are not able to make a continuous costing of the spares contracts.

You will appreciate that, as in all other industries, the three elements

of cost in the aircraft industry are Material, Labour and Overhead. For purposes of aircraft costing, these prime elements expand themselves into five groups, namely:

Direct Material
Direct Labour
Labour and Overhead purchased from a Sub-Contractor
General Overhead, and
Direct Overhead.

Let us proceed to touch on each of these items separately, so as to better understand any benefit from to-night's subject.

Cost of Direct Materials

For practical purposes, all direct materials should enter a store and be requisitioned out to the shop work order on which they are to be used. It has been previously mentioned, and here elaborated, that a store is a conveniently placed area in the factory, designated for the accumulation of specified, classified materials. From such stores the materials are shipped to outside destinations, or to the various shop departments, by the use of a material requisition.

A wise precaution is to number all material requisitions consecutively, as they are presented at the various stores. This will prevent the bugbear of lost requisitions, as, at the end of each day, the accumulated requisitions can be sorted into numerical order, and all missing requisitions accounted for, before proceeding with the posting to the stores ledgers.

Another precaution, is to have the Production Control Department pre-typewrite all requisitions for raw materials. These requisitions are then issued to the factory, together with the production order, only when manufacture is to start. Because, where the writing of material requisitions is left to the factory foremen or their help, there is every chance that quantities of material will be charged in excess for one batch and short on another. This difficulty multiples itself by the number of batches in the contract. Then there is the matter of rivets, washers, cotter pins, etc., which are commonly known as "pan" stock. These comprise about 2½% of the total materials used in the aircraft. Requisitions for "pan" stock should be the only hand-written requisitions which could be accepted at the stores.

There comes to mind the alternatives to this method of costing Direct Materials. In one case, the materials, upon purchase, are allocated direct to shop work orders. But this results in very loose control, as too often the materials are stored wherever space is available in the factory and, inevitably, they are used on work orders for which they were not intended.

In leaving this item of costing of Direct Materials, it is well to consider that Direct Material naturally sub-divides itself into, one—Direct Material Supplied by the Prime Contractor; and two—Direct Material Supplied by the Sub-Contractor. Obviously so, both as to actual construction of aircraft, and because the Cost Accountant must know distinctly the value of the material used by the Sub-Contractor. For this value of material used by the Sub-Contractor, plus the Labour and Overhead purchased from the Sub-Contractor, adds up to the total expenditure for sub-contract work. However, let us diverge at this point to our second item:

Costing of Direct Labour

In considering the costing of direct labour, it has been found best to classify, as productive labour, all mass produced direct labour items, such as: painting, punch press work, hydro press work, and joggle press work, to illustrate only a few. On such items, it is possible to issue a work order to the factory to cover all mass produced items required for the contract. If necessary, the various types of work can be itemized or segregated within the work order. The resultant direct labour that accumulates in this work order, during each accounting period, can then be pro-rated over the various batches of aircraft, on the basis of the productive hours that have been expended on each batch during the period in question.

Some aircraft manufacturers consider the mass produced, direct labour items as expense. Their reason is that their timekeepers find it difficult to allocate to the various batches, the correct elapsed time for each type of mass produced work. As has just been indicated, it is not quite right to class such direct mass labour as expense, because the resultant direct man hours required to build the aircraft are untrue, the overhead rate is inflated, and the productive labour is reduced.

This brings us to our third item, the

Costing of Labour and Overhead Purchased From a Sub-Contractor

Every prime aircraft manufacturer inevitably lets some portion of the actual work of the manufacture of the aircraft, to a sub-contractor. It is most advisable that the Cost Accountant keep a separate record of the labour and overhead and the productive hours provided by the sub-contractor. You will recall that, under the discussion of the Costing of Direct Material, it was found that any materials the sub-contractor may supply are correctly included in Direct Material.

The Cost Accountant can arrive at the total hours sub-contracted by obtaining from the sub-contractor, the productive man hours, or total cost per productive hour; that is, the Direct Labour and Overhead.

The Direct Labour hours of the prime contractor, coupled with the Direct Man Hours of the sub-contractor, result in the number of direct labour hours used in the construction of the aircraft. In this manner, the Cost Accountant is able to compare the productive man hours between batches, even though the percentage of sub-contracted work may vary considerably from batch to batch.

Our fourth item concerns:

Costing General Overhead.

General Overhead, in the aircraft industry, is used to describe all those items of expense which can be allocated satisfactorily, on a Direct Labour basis, to the various batches of work that are in progress. General Overhead can be expressed as a percentage of Direct Labour. In so doing, there are three recognized methods that can be used to effect the distribution at the end of each accounting period. They can be named as:

(1) An Accumulative Rate
(2) An Estimated Rate, and
(3) A Current Accounting Period Rate.

The Accumulative Rate is a very satisfactory method of distributing General Overhead when only a few contracts are involved. All batches must be left open for the entire fiscal year, and adjusted to the year's

actual. Batches which have been completed during the fiscal year can then be closed.

The use of the Estimated Rate is satisfactory, provided Management can pre-determine production and overhead accurately for the entire year; otherwise, it is necessary to leave all batches open until the end of the fiscal year.

The Current Accounting Period Average Rate is the most practical where an aircraft manufacturer has a large number of batches in process over a year. The reason lies in that the Cost Accountant is able, at the end of each accounting period, to close out from his Work in Progress any batches which may have been completed.

The fact that the Overhead Rate varies from period to period, often discourages the wider use of a Current Accounting Period Rate system. This is regrettable, for the rate can be controlled, as will be explained. Especially, where the manufacturer has sufficient work on hand to maintain a fairly constant dollar value of Direct Labour from one accounting period to another.

The fluctuation in the Overhead Rate is usually caused by three types of expense items:

(1) Perishable Tools and Shop Supplies
(2) Fuel for Heating, Water Taxes, Power and Light, Vacation Wages
(3) Telephone, Rental of Buildings and Equipment, Payroll Distribution Expenses.

The first group of expense items—Perishable Tools and Shop Supplies—will contribute to the fluctuation when they are charged directly to overhead. The remedy lies in entering these items in a Store, and then having them requisitioned out as required.

The second group—Fuel for Heating, Water Taxes, Power and Light, and Vacation Wages—can be controlled by setting up a reserve account for each of these items in the General Ledger. From these accounts, a prescribed amount can be charged into Overhead each month.

The third type of items—Telephone, Rental of Buildings and Equipment, Payroll Distribution Charges, etc., can be controlled by assigning to a definite member in the Accounting Department, the responsibility for putting these expense items through the books each month.

Thus, by the use of stores, reserve accounts, and accounting personnel, the Current Accounting Period Rate method of distributing General Overhead can be made to operate so that the fluctuations will be negligible.

Now we come to our fifth item:

Costing Direct Overhead

The term "Direct Overhead", in the aircraft industry, is applied to those items of expense that cannot be satisfactorily distributed to batches on a direct labour basis. You can understand that gasoline and oil used in the testing of aircraft, test flight insurance, and pilots' salaries, are a direct charge to the batches concerned.

Engineering or draughting office expenses should be charged directly to the contracts concerned, pro-rated on the basis of the draughtsmen's time applicable to each contract. At the end of each accounting period, this direct charge to each contract should be further pro-rated over the various batches on a direct labour basis. Please notice, that this procedure

bears the additional recommendation of assigning a portion of these engineering or draughting office expenses over the spares contracts.

In brief, to achieve the total cost for profit, the Cost Accountant must, in some manner, give consideration to the costs outlined as: Direct Materials —Direct Labour—labour and Overhead Purchased from a Sub-Contractor—General Overhead and Direct Overhead.

When organizing the complex and varied prime elements of cost, it is well to incorporate some measure of control. The Functional type of expense accounting system has been found to be very suitable for those aircraft companies who desire a full operating control. By "full operating control" is meant—departmental operating controls on controllable direct labour and controllable overhead throughout the organization.

To place this full operating control system into effect, it is necessary to have, department by department, the direct labour expended in each such department, and the indirect controllable expenses, account by account. By matching these costs against standards, the Management can have a full picture of the efficiency of each department in the organization. In fact, the Cost Accountant can go even farther, and allocate the non-controllable expenses to all of the Productive departments in the factory, to the end that the overhead rate can be determined for every department.

A further big advantage of using a Functional Expense Accounting System is that, irrespective of the size of the Factory, it is not necessary to have more than 100 Expense Accounts. Each of these expense accounts is distributed over all the departments in the organization, and the source of a major increase in any account can be quickly traced to the department, or departments, causing the trouble.

A main difficulty that may arise when setting up the system, is the difference in opinion between the Cost Accountant and Industrial Engineer, as to the definition of Direct Labour. It has been said that painting, punch press work, hydro press work, and joggle press work, are definitely items of Direct Labour. For their own needs, some Cost Accountants consider these items as items of expense, whereas, the Industrial Engineer will insist that such items are Direct Labour. To facilitate the compilation of the necessary operating control reports, and to balance them with the accounts, the Cost Accountant and the Industrial Engineer must get together and agree as to what is "Direct Labour" and what is "Expense."

No matter how well a cost system may be organized, so far as accounting in the pure sense is concerned, a very strong Production Control Department is essential to the operation of any aircraft costing system. It has been elsewhere mentioned, and it is here repeated, that the Production Control Department issues the work orders to the factory with the predetermined material requisitions attached. But, unless the proper control is being exercised over the basic records, true costs cannot be obtained.

That is the note on which this address should be concluded. The original premise was to the effect that, if costing in aircraft was to be a success, it must adhere to the natural requirements of management and to the actual construction of the aircraft. The adherence to actual construction, of necessity, calls for the co-operation of all individuals, all departments, all planners. It follows, that the success of the costing system must finally be judged against the requirements of management.

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